Valuations of "Sustainably Produced" Labels on Beef, Tomato, and Apple Products

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Introduction/Problem Statement

- "Sustainably produced" is an increasingly common credence claim
  - Jan. 07' – Jan. 09' 483 new food products introduced in North America carrying "sustainable" or "sustainably produced" label (Mintel's GNPD)
  - Example product description:
    - "World Berries Organic Inca Berries, also known as gooseberries, is vegan raw food, produced by sustainable methods, and sourced from all over the world."
  - No existing, standardized definition
    - Similar dilemma for "locally grown" (Darby et al., 08)

Introduction/Problem Statement

- Little known about how consumers process corresponding labels or WTP
  - Possible inferences:
    - Farm size, corporate ownership, hired labor, production practices such as hormone or pesticide use
  - Are answers product specific or general for all foods?
- Private marketing efforts, public interest in efficient markets, and consumer welfare effects of labeling regulations hinge on these points.

Research Design/Data Used

- Oct. 2008, online survey of 1,502 U.S. consumers
  - Beef, tomato, and apple versions
- Assessed inferences of “sustainable production”
- Contingent valuation approach

What does your definition of a beef farm using "sustainable production" practices entail?

	Beef (n=500)	Tomato (n=502)	Apple (n=500)
1 if "family owned;" 0 otherwise	52.8%	52.2%	54.0%
1 if "corporate ownership;" 0 otherwise	32.8%	32.9%	30.2%
1 if "only family labor;" 0 otherwise	24.6%	24.1%	27.2%
1 if "hired labor allowed;" 0 otherwise	63.2%	62.9%	64.0%
1 if "smaller than average size;" 0 otherwise	37.2%	33.3%	33.4%
1 if "hormone-free;" 0 otherwise	72.2%	69.7%	67.4%
1 if "organic production;" 0 otherwise	60.2%	67.5%	68.8%
1 if "natural production;" 0 otherwise	76.4%	82.7%	79.8%
1 if "environmentally friendly;" 0 otherwise	77.6%	83.5%	80.2%
1 if "pasture-based;" 0 otherwise	70.0%	N/A	N/A
1 if "pesticide-free;" 0 otherwise	N/A	73.3%	69.0%

Factor Analysis

- Factor analysis generates smaller set of variables (3) summarizing perceptions (10):
  - F1: “Production Attributes”
    - Hormone-free, pesticide-free, enviro.-friendly, etc.
  - F2: “Family or Small Farm”
  - F3: “Hired Labor or Corporate Ownership”

    - 3 variables enter our contingent valuation model (Boxall & Adamowicz, 2002)

Core Question:

Double-bounded format to identify net-WTP (Loureiro, McCluskey, and Mittlehammer, 2002):

Would you be willing to pay a premium for beef labeled as "sustainably produced?" ***YES*** *OR* ***NO***.

Follow-up question [if yes (no)]:

Would you buy beef labeled as "sustainably produced" if it cost X% more (less) than beef not labeled as "sustainably produced" ***YES*** *OR* ***NO***.

Core Question

- Answers identify one of four WTP intervals:
  - (*nWTP* < -*X*) – NO/NO
  - (-*X* <= *nWTP* < 0) – NO/YES
  - (0 <= *nWTP* < *X*) – YES/NO
  - (*X* <= *nWTP*) – YES/YES

	Beef (n=500)	Tomato (n=502)	Apple (n=500)
1 if *Yes/Yes* ; 0 otherwise	14.8%	14.7%	14.6%
1 if *Yes/No* ; 0 otherwise	30.2%	25.1%	25.6%
1 if *No/ Yes* ; 0 otherwise	34.6%	43.0%	43.6%
1 if *No/No* ; 0 otherwise	20.4%	17.1%	16.2%
1 if *No* to 1st question	55.0%	60.2%	59.8%

Double-bounded Dichotomous Choice Model

- Optimized log-likelihood function is:

$$\ln L = \sum_{i=1}^{K} \left\{ d_i^{NN} \ln \pi^{NN} + d_i^{NY} \ln \pi^{NY} + d_i^{YN} \ln \pi^{YN} + d_i^{YY} \ln \pi^{YY} \right\}$$

- Empirical specification of nWTP:

$$nWTP_i = \alpha_0 + \alpha_P X_i + \beta' Z_i + \varepsilon_i$$

- Z is vector of explanatory variables; X from presented question
- Mean WTP -= $-\left(\alpha_0 + \beta' \overline{Z}\right) / \alpha_P$

Results: Entire Population

- Mean WTP
  - Beef: -5.1% [-10.2%, 0.0%]
  - Tomato: -7.8% [-12.9%, -2.5%]
  - Apple: -5.5% [-10.8%, -0.8%]
- WTP Higher for:
  - Beef: Younger, Higher Income, Production Practice Inferring (F1)
  - Tomato: College, Less Kids, F1
  - Apple: College, Consume, F1

Conditional Demand Results: Yes in 1st question

- Mean WTP
  - Beef: 23.6% [7.6%, 35.0%]
  - Tomato: 19.4% [-17.3%, 36.4%]
  - Apple: 15.9% [-31.3%, 35.3%]
- WTP Higher for:
  - Beef: Production Practice Inferring (F1)
  - Tomato: College, No Visit in 5 Yrs, F1, Family/Small Farm Inferring (F2)
  - Apple: Male, Visit in 5 Yrs, F1
    - Lower WTP for those inferring Corporate Ownership (F3)

Implications/Conclusions

- Fail to reject Ho of equal WTP for beef, tomato, and apple
- Conditional demand for “sustainably produced” beef may exist
  - Not necessarily for tomatoes and apples
- Inferences regarding production practice attributes strongly drive demand
  - Target marketing investments may be particularly sensitive to future standardization of labeling claims and definitions.

Needed Future Work

- Questions to be addressed:
  - Where do consumers get information shaping their inferences regarding non-standardized labeling claims?
  - What public support exists for alternative legislation on production practices or associated mandatory labeling (think COOL)?

QUESTIONS

- Tonsor's website (includes presentation):
  - http://www.msu.edu/user/gtonsor/